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AUTHOR(S):

FUJIOKA, Yuichiro

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INTRODUCTION TO THE SPECIAL TOPIC "PLANT USES, LIVELIHOODS, AND SUSTAINABILITY IN AFRICA"

Yuichiro FUJIOKA
Frontier Research Institute for Interdisciplinary Sciences, Tohoku University

This special topic is part of the research outcome of the project "Sustainability of Plant Utilization and Management of Local Vegetation in Globalizing Africa," which was started in 2015 by the Center for Integrated Area Studies (CIAS), Kyoto University. The aim of this project was to examine the sustainability of plant uses and local vegetation in Africa through comparative discussion of some case studies regarding landscape changes, vegetation management, and local knowledge of plant uses. In particular, we focused on the diversification of livelihood activities based on the use of local resources and ecosystems involved in the global dynamics of social and economic environments and examined how local activities or strategies affect the sustainability of plant resource uses.

"Sustainable use of ecosystems" has become a global issue in recent years; for example, it is included in the Sustainable Development Goals (SDGs Topic 15, UN, 2015). Sustainability is a multidimensional concept, thus we need to consider it from different perspectives. The aims of this special topic are two-fold. First, from the target and comparative perspective, the savanna and woodland environment in West, East and Southern Africa are the focused. Second, toward consideration of sustainability, the relations between the local people and environments based on livelihood via natural resource uses from different approaches are examined.

The climatic and vegetation environment in Africa features the two extreme conditions of humid and arid; and in between, vast transition zones are distributed, which are surrounded by tropical rain forest. The vegetation in these transition zones is classified into various types of community, mainly several varieties of woodland and savanna (Itani & Terashima, 2001). The local people have developed various types of livelihood and resource use systems related to the social bonds with the environmental settings, while at the same time, they have changed and disturbed the local ecosystems.

In recent years, however, the issues of land and forest degradation that have been documented in most ecosystems worldwide include woodlands and savanna are mainly due to human disturbances (Millennium Ecosystem Assessment, 2005), which are strongly related to population increase and land shortage. Thus, some environmental organizations emphasize the importance of "sustainable intensification" of livelihood and resource uses, for example, by combining livelihoods such as in agroforestry or agropastoralism. On the other hand, we need to focus on the indigenous livelihood systems that are harmonized with the natural and social environments in each area, as the local people have flexibly adjusted their livelihood and resource use systems. Toward examining the sustainability of natural

resource uses, we suggest clarifying the practices of adjustment of natural resource uses and the diversity of the relationships between the local ecosystem and the peoples' activities.

This special topic is composed of three papers that present surveys of different vegetation areas in West, East, and Southern Africa from different perspectives. In the first paper, Koki Teshirogi and two coauthors describe the differences and commonalities of vegetation structures and plant uses in four local sites within one broad vegetation zone, mopane vegetation, in southern Africa. Many ecological and physiological studies about mopane vegetation have indicated homogeneity in species composition, with more than 90% of the total phytomass as mopane tree (*Colophospermum mopane*). However, in this paper, heterogeneity in species composition, mopane tree shape, and use of the area by local people among the four sites in northern Namibia is seen. Although the dominant species is mopane tree for all sites, differences exist in the mutual interrelations between people and local vegetation via livelihood based on the environmental situation.

In the second paper, Masaaki Hirai focuses on the changes in the use of *Faidherbia albida*, which is a typical species found in farmed parkland in semi-arid areas of West Africa. "Farmed parkland" is a landscape in which specific useful trees are scattered across agricultural fields, and it is widespread throughout the African savanna. *F. albida* is known for the unique characteristic of "reverse phenology" and its beneficial use in intensive farming systems that combine crop and livestock raising. How the Sereer people reshaped their techniques of foliage and branch collection for fodder and fuel wood in response to socio-economic changes in the Sereer community, Senegal was described in this paper. It is important to pay attention to how resource scarcity and emerging problems are addressed by different social actors to understand the dynamics and sustainability of farmed parklands.

In the third paper, Kana Yamamoto discusses the recent changes in cattle keeping under population pressure in Tanzania. Although the combination of agriculture and pastoralism is a major livelihood system in the savannas and woodlands of Africa, some areas are faced with issues regarding the balancing of cropping and pasturing under conditions of population growth and land shortage. Trials of adaptation by local people are described in this paper, and the importance of livestock traders and barter exchanges for sustaining livestock of local people is emphasized.

From these papers, we are able to understand the diversity of adaptation in local ecosystems and the development of livelihood and natural resource uses in the local environmental settings and social connections. These methods have changed and adjusted with the changes in social environment, such as increased scarcity of land and resources. When considering the sustainability of natural resource uses, it is important to focus on and evaluate the local strategies and practices.

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Author's Name and Address: Yuichiro FUJIOKA, *Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, 6-3 Azaaoba, Aramaki, Aoba-ku, Sendai 980-8578, JAPAN*.

E-mail: yuichiro.fujioka.b8 [at] tohoku.ac.jp